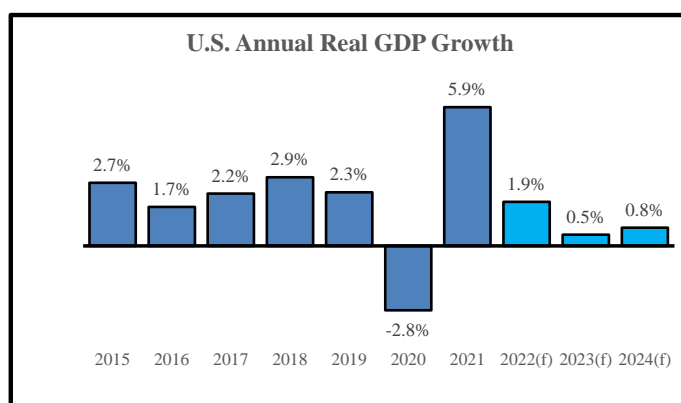


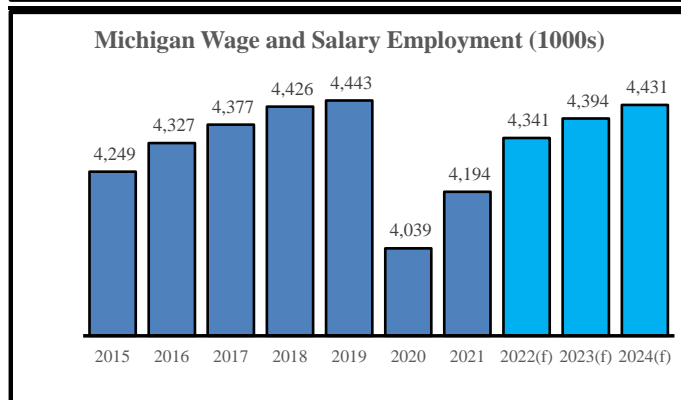
University of Michigan RSQE Economic Forecast

On November 17-18, 2022, the University of Michigan's Research Seminar in Quantitative Economics released its November 2022 economic forecasts. Below are some highlights of those forecasts. ^(n, b, c):



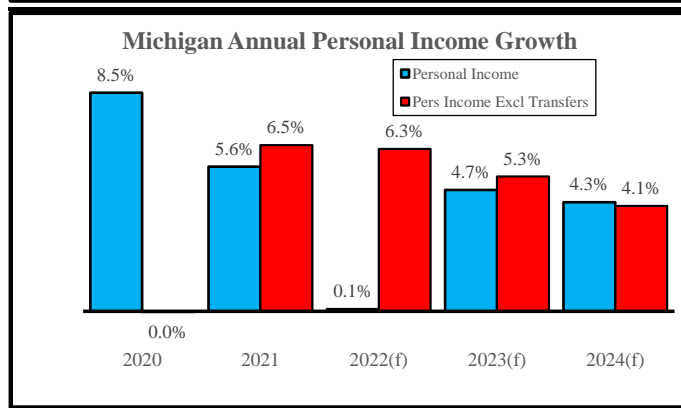
U.S. Economic Outlook

- RSQE projects a brief and mild recession in the latter half of 2023 followed by a modest recovery. As a result, real GDP is forecast to rise only slightly in 2023 and 2024.
- Given pent-up demand, light vehicle sales are forecast to rise modestly with sales increasing from 13.9 million units in 2022 to 15.1 million units in 2023 and 15.5 million units in 2024.
- The unemployment rate is forecast to rise modestly from 3.6% in 2022 to 3.8% in 2023 and 4.5% in 2024.
- Inflation, as measured by the Consumer Price Index, is forecast to slow from 8.1% in 2022 to 4.5% in 2023 and 2.5% in 2024.



Michigan Employment Outlook

- After falling to 4.3% in 2022, the State's unemployment rate is forecast to average a slightly lower 4.2% rate in 2023 before rising to 4.6% in 2024.
- Michigan wage and salary employment is forecast to rise 3.4% in 2022, 1.2% in 2023 and 0.9% in 2024.



Michigan Personal Income Outlook

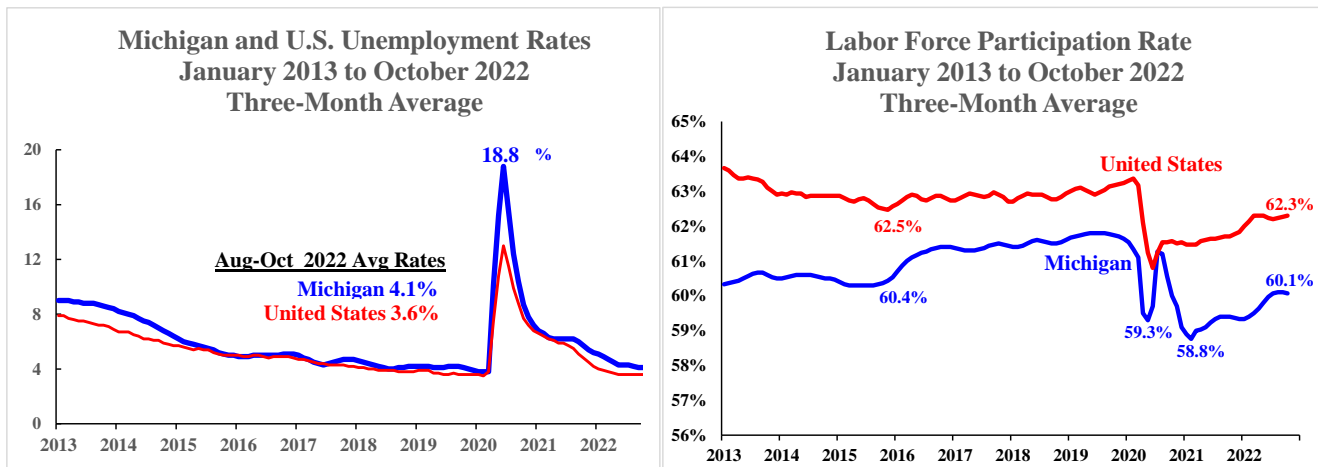
- With the unwinding of COVID economic relief, in 2022, total Michigan personal income rose just 0.1%. Excluding government transfer payments, Michigan personal income rose 6.3% in 2022.
- Total Michigan personal income is forecast to rise 4.7% in 2023 4.3% in 2024. After falling 10.1% in 2022, inflation-adjusted disposable personal income is projected to increase 1.7% in 2023 and 2.0% in 2024.
- After rising 8.2% in 2022, nominal Michigan wages and salaries are forecast to rise 5.0% in 2023 and 3.3% in 2024.

October 2022 Summary

Unemployment Rate Estimates

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- The monthly Michigan unemployment rate estimate rose slightly to 4.2 percent in October. The three-month average of the Michigan unemployment rate is 4.1 percent for October. Compared to last October, the three-month average is down 1.6 percentage points. Compared to the pre-pandemic February 2020 rate, the current average is up 0.3 of a percentage point.
- The average number of people employed in Michigan between August 2022-October 2022 was 82,900 lower than the number employed in February 2020. Compared to the three-month average of people employed between August 2021-October 2021, the current three-month average is up 135,400 people. The August 2022-October 2022 average of people unemployed is 14,700 people higher than the number of unemployed in February 2020.
- The U.S. unemployment rate rose to 3.7 percent in October. October's national jobless rate is 0.9 of a percentage point lower than the October 2021 rate (4.6 percent), and 0.2 of a percentage point higher than the February 2020 rate (3.5 percent).
- Both the Michigan and U.S. labor force participation rates remain significantly lower than their pre-pandemic participation rates.



Employment by Place of Residence (in Thousands)^(a)

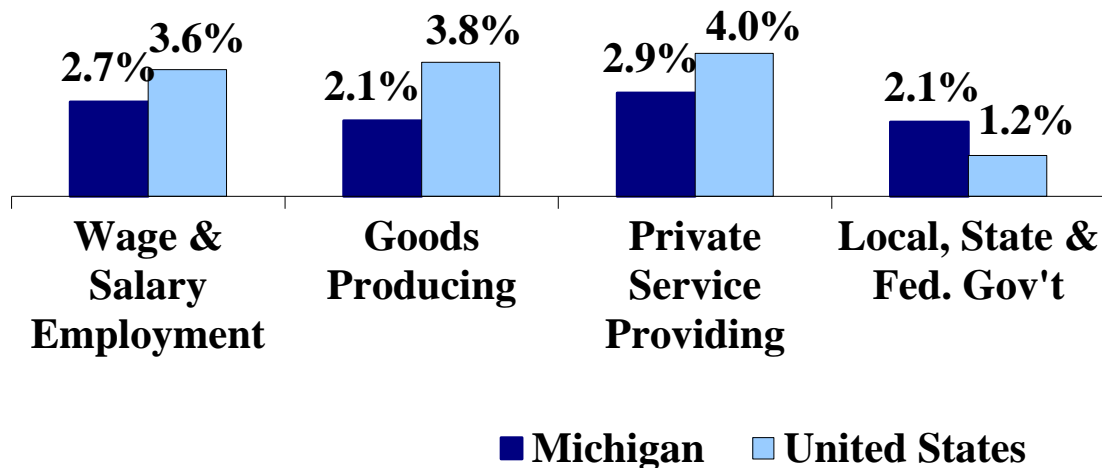
	Annual 2021	Aug 2022	Sep 2022	Oct 2022	Chg Fr Mo Ago Level	Chg Fr Mo Ago %	Chg Fr Yr Ago Level	Chg Fr Yr Ago %	Three Month Average
Michigan									
Labor Force	4,776	4,859	4,861	4,855	-6	-0.1%	63	1.3%	4,858
Employed	4,496	4,658	4,660	4,650	-10	-0.2%	114	2.5%	4,656
Unemployed	280	201	201	205	4	2.0%	-51	-20.1%	202
Unemployment Rate	5.9%	4.1%	4.1%	4.2%	n.a.	0.1% pts	n.a.	-1.2% pts	4.1%
United States									
Labor Force	161,204	164,746	164,689	164,667	-22	0.0%	3,057	1.9%	164,701
Employed	152,581	158,732	158,936	158,608	-328	-0.2%	4,374	2.8%	158,759
Unemployed	8,623	6,014	5,753	6,059	306	5.3%	-1,316	-17.8%	5,942
Unemployment Rate	5.3%	3.7%	3.5%	3.7%	n.a.	0.2% pts	n.a.	-0.9% pts	3.6%

Employment by Place of Work (Payroll)

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- Compared to October 2021, Michigan payroll employment was up by 113,600 jobs (2.7 percent). State payroll employment rose by 10,200 jobs in October 2022 from September 2022. Nationally, October 2022 payroll employment was up by 5.3 million jobs (3.6 percent) from a year ago. National employment rose 261,000 jobs in October.

Payroll Employment Growth



- In the goods-producing sector, Michigan payroll employment increased 2.1 percent in October from a year ago; employment in the private service-providing sector rose 2.9 percent. From a year ago, October national payroll employment rose 3.8 percent in the goods-producing sector and increased 4.0 percent in the private service-providing sector.
- At 42.1 hours, manufacturing weekly hours in Michigan were up 0.8 of an hour from last year.

Wage and Salary (Payroll) Employment (in thousands)^(b)

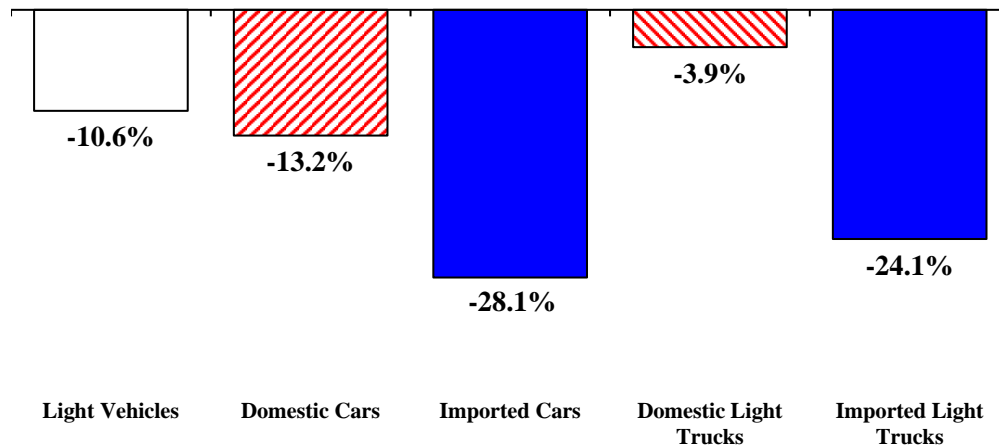
	2021 <u>Annual</u>	MI Oct <u>2021</u>	MI Oct <u>2022</u>	Percent Change	2021 <u>Annual</u>	US Oct <u>2021</u>	US Oct <u>2022</u>	Percent Change
Wage & Salary Employment	4,193.5	4,257.1	4,370.7	2.7%	141,308	148,005	153,308	3.6%
Goods Producing	766.8	779.7	796.4	2.1%	19,397	20,499	21,277	3.8%
Manufacturing	583.7	594.8	610.4	2.6%	12,294	12,466	12,922	3.7%
Private Service Providing	2,853.2	2,901.3	2,986.1	2.9%	99,604	105,412	109,681	4.0%
Trade, Trans. & Utilities	777.3	782.4	801.3	2.4%	27,319	28,013	28,823	2.9%
Services	1,791.6	1,832.4	1,889.8	3.1%	61,491	65,696	68,844	4.8%
Local, State & Fed. Gov't	573.5	576.1	588.2	2.1%	22,307	22,094	22,350	1.2%
Manufacturing Weekly Hours	40.8	41.3	42.1	0.8 hrs	42.7	41.3	41.1	-0.2 hrs

Motor Vehicle Sales Down From Last Year

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- The U.S. light vehicle sales rate, less constrained by supply chain shortages, rose to 14.9 million units in October. Compared to last October, sales were up 12.7 percent.
- U.S. sales of domestic light vehicles rose 15.0 percent from last October while foreign sales increased 4.3 percent. In October 2022, at 20.1 percent, the foreign share of U.S. light vehicle sales was down 1.6 percentage points from a year earlier.
- Auto sales increased 17.6 percent compared to last October, while light truck sales increased 11.4 percent from October 2021. Year-over-year (y-o-y), heavy truck sales were up 13.8 percent from last October.
- In September 2022 (the most recent month for which inventory data are available), retail vehicle inventories were up 29.9 percent from last September—the sixth straight percentage year-over-year increase following 24 months of year-over-year declines.

Year-to-Date 2022 Vehicle Sales Down From Year Ago



Motor Vehicle Sales Statistics

(Millions, Seasonally Adjusted Rates, unless otherwise specified)

	<u>2021</u> <u>Total</u>	<u>Aug</u> <u>2022</u>	<u>Sep</u> <u>2022</u>	<u>Oct</u> <u>2022</u>	<u>3 Month</u> <u>Average</u>	<u>Oct</u> <u>Chg fr</u> <u>Yr Ago</u> <u>Level</u>	<u>Oct</u> <u>Chg fr</u> <u>Yr Ago</u> <u>%</u>
Autos	3.4	2.8	2.9	3.2	3.0	0.5	17.6%
Domestics	2.4	2.0	2.1	2.4	2.2	0.4	19.7%
Imports	1.0	0.8	0.8	0.8	0.8	0.1	11.4%
Import Share	29.1%	28.1%	26.1%	24.4%	26.1%	-1.4%	pts
Light Trucks	11.6	10.4	10.7	11.7	10.9	1.2	11.4%
Domestics	9.0	8.4	8.6	9.5	8.8	1.1	13.8%
Imports	2.6	2.0	2.0	2.2	2.1	0.0	2.0%
Import Share	22.3%	19.4%	19.2%	18.9%	19.2%	-1.7%	pts
Total Light Vehicles	14.9	13.2	13.6	14.9	13.9	1.7	12.7%
Heavy Trucks	0.5	0.5	0.5	0.5	0.5	0.1	13.8%
Total Vehicles	15.4	13.7	14.0	15.4	14.4	1.7	12.7%

Retail Inventories, Motor Vehicle and Parts Dealers (billions of dollars) ^(d)

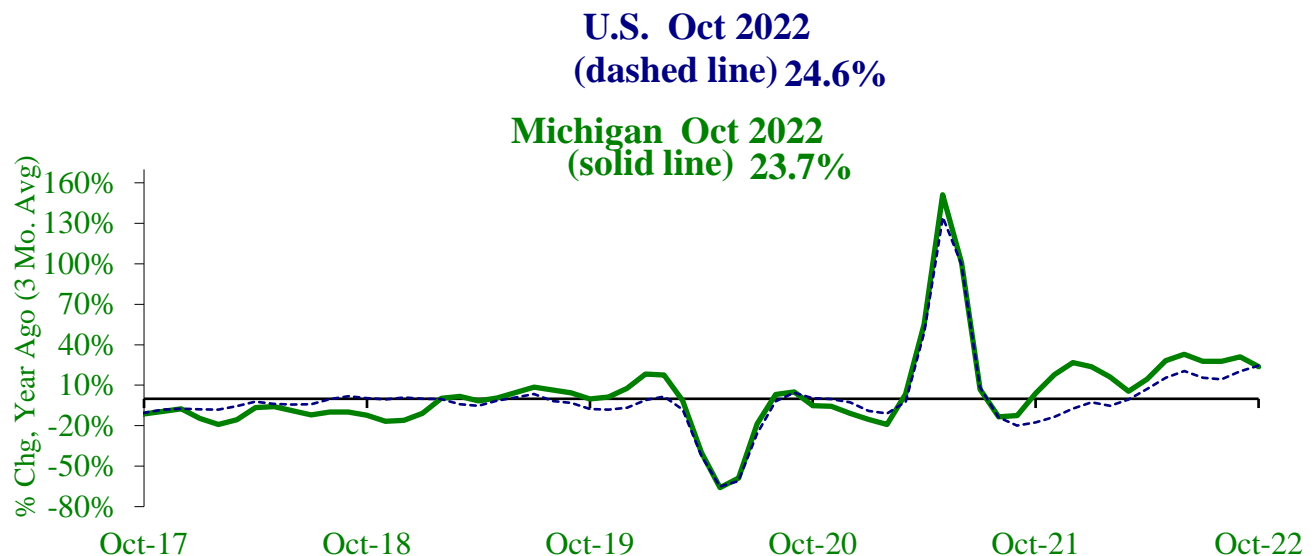
	<u>2021</u> <u>Average</u>	<u>Jul-22</u>	<u>Aug-22</u>	<u>Sep-22</u>	<u>3 Month</u> <u>Average</u>	<u>Chg fr</u> <u>Year Ago</u> <u>Level</u>	<u>Chg fr</u> <u>Year Ago</u> <u>%</u>
Inventories	\$162.1	\$182.8	\$189.4	\$193.0	\$188.4	\$44.5	29.9%
Inventory/Sales Ratio	1.32	1.47	1.48	1.51	1.49	0.28	

Michigan Vehicle Production Up from Year Ago

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- Michigan vehicle production rose 7.9 percent from October 2021 while national vehicle production increased 17.6 percent from last October. In October 2022, Michigan vehicle production totaled 192,789 units.
- In October 2022, auto production rose 72.1 percent year-over-year (y-o-y) in Michigan and was up 18.5 percent nationally; truck production increased 4.1 percent in Michigan and was up 17.4 percent nationally.
- Comparing the three-month average of vehicle production in August 2022-October 2022 to production in August 2021-October 2021, Michigan's average production was up 23.7 percent while average production was up 24.6 percent nationally.

Three-Month Average of Michigan Vehicle Production Up from Year Ago in October



Motor Vehicle Production Statistics

(Thousands, unless otherwise specified)

	2021 Monthly <u>Average</u>	Aug <u>2022</u>	Sep <u>2022</u>	Oct <u>2022</u>	3 Month <u>Average</u>	Oct Level Chg <u>fr Yr Ago</u>	Oct % Chg <u>fr Yr Ago</u>
U.S. Production ^(e)							
Autos	138.4	170.5	165.5	167.3	167.8	26.1	18.5%
Trucks	621.5	788.5	775.7	780.9	781.7	115.9	17.4%
Total	759.9	959.0	941.2	948.2	949.5	142.1	17.6%
Michigan Production ^(f)							
Autos	11.1	18.4	17.0	17.4	17.6	7.3	72.1%
Trucks	143.4	189.2	177.7	175.3	180.8	6.9	4.1%
Total	154.4	207.6	194.7	192.8	198.4	14.2	7.9%
Michigan as % of U.S.	20.3%	21.6%	20.7%	20.3%	20.9%	-1.9% pts	

U.S. Economic Conditions

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	<u>Jul-22</u>	<u>Aug-22</u>	<u>Sep-22</u>	<u>Oct-22</u>	<u>Change from Year Ago</u>
KEY ECONOMIC INDICATORS					
Consumer Sentiment ^(h)	51.5	58.2	58.6	59.9	-11.8 points
ISM Manufacturing Index ⁽ⁱ⁾	52.8	52.8	50.9	50.2	-10.6 points
ISM Non Manufacturing Index ⁽ⁱ⁾	56.7	56.9	56.7	54.4	-12.3 points

INFLATION ^(k)	<u>Jul-22</u>	<u>Aug-22</u>	<u>Sep-22</u>	<u>Oct-22</u>	<u>Change from Year Ago</u>
1982-84 = 100 (CPI)					
Nov 2009 = 100 (PPI)					
U.S. Consumer Price Index	296.3	296.2	296.8	298.0	7.7%
Detroit CPI	NA	271.6	NA	274.5	8.5%
U.S. Producer Price Index	140.3	140.0	140.0	140.5	8.0%

INTEREST RATES					
90 Day T-Bill ^(l)	2.23%	2.63%	3.13%	3.72%	3.67% points
10 Year Treasury Securities ^(l)	2.90%	2.90%	3.52%	3.98%	2.40% points

INDUSTRIAL PRODUCTION ^(l)	104.8	104.7	104.8	104.7	3.3%
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CAPACITY UTILIZATION ^(l)	80.2%	80.0%	80.1%	79.9%	1.3% points
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RETAIL SALES ^(d)	\$681.1	\$685.7	\$685.8	\$694.5	8.3%
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HOUSING STARTS and SALES	<u>Jul-22</u>	<u>Aug-22</u>	<u>Sep-22</u>	<u>Oct-22</u>	<u>% Change From Year Ago</u>
(Millions Annual Rate)					
Housing Starts ^(d)	1.377	1.508	1.488	1.425	-8.8%
Existing Home Sales ^(m)	4.820	4.780	4.710	4.430	-28.4%

DURABLE GOODS ORDERS ^(d)	\$273.2	\$273.8	\$274.6	\$277.4	10.7%
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PERSONAL INCOME ^(c)	<u>2021.3</u>	<u>2021.4</u>	<u>2022.1</u>	<u>2022.2</u>	<u>% Change From Year Ago</u>
(Billions, Seasonally Adj & Annualized)					
Michigan	\$555.6	\$553.2	\$560.0	\$566.0	0.8%
U.S.	\$20,998.9	\$21,158.0	\$21,317.8	\$21,622.7	3.4%

GROSS DOMESTIC PRODUCT ^(c)	<u>2021.4</u>	<u>2022.1</u>	<u>2022.2</u>	<u>2022.3</u>	<u>Annualized % Chg From Last Qtr</u>
(Billions of Chained 2012 Dollars, Seasonally Adj & Annualized)					
	\$20,006.2	\$19,924.1	\$19,895.3	\$20,039.4	2.9%

- (a) Seasonally adjusted. Sources: Bureau of Labor Statistics, U.S. Department of Labor and Michigan Department of Technology, Management and Budget.
- (b) Bureau of Labor Statistics, U.S. Department of Labor (BLS 790). Page 2 Michigan three-month average unemployment rate graph values use interpolated monthly values for January 2021-August 2021.
- (c) Bureau of Economic Analysis, U.S. Department of Commerce.
- (d) Bureau of the Census, U.S. Department of Commerce. Seasonally adjusted.
- (e) Automotive News.
- (f) Michigan Department of Treasury.
- (g) Michigan Department of Technology, Management and Budget.
- (h) University of Michigan Survey of Consumers.
- (i) Institute for Supply Management (ISM), formerly NAPM.
- (j) The Conference Board.
- (k) Bureau of Labor Statistics, U.S. Department of Labor.
- (l) Seasonally adjusted rates (except interest rates). Federal Reserve System Board of Governors. 2012 equals 100. Treasury bill rate (secondary market).
- (m) National Association of Realtors.
- (n) University of Michigan Research Seminar in Quantitative Economic November 2022 Economic Forecasts.